

Bored Pile Retaining Walls

Technical Data

Application

Mainly employed in the construction of basement retaining walls, underpasses, underground tanks and structures.

Choice of system depends on a variety of factors including soil type retained height, deflections, propping geometry, etc.

Advantages

- Avoids excessive bulk excavation.
- Can be installed in restricted working space.
- When combined with Cementation guide wall/capping beam can show savings in cost and time.
- Can help to control ground movement.



Bored cast-in-situ piles of either small or large diameter are frequently used as an efficient and economic method of constructing temporary or permanent retaining walls. These techniques are suitable for the provision of deep basements, underground structures and motorway cuttings where working space is limited or adjacent existing structures require restraint. They avoid excessive bulk excavation and help to control ground movements.

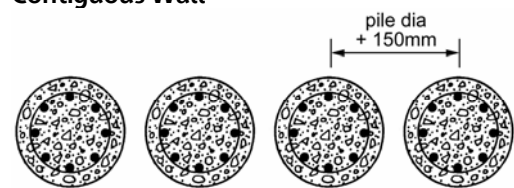
There are three distinct bored pile wall options in current use:

- Contiguous wall
- Secant wall – hard/soft or hard/firm
- Secant wall – hard/hard

The choice of a particular system is influenced by a number of factors. These include soil type (granular or cohesive, soft or stiff), the ground water profile (perched, high level), maximum retained heights, construction time available, propping requirements, cost and life span.

Each option can be constructed using either continuous flight auger (CFA) or rotary piling methods. Pile diameters can be constructed up to 1200mm for CFA and 3000mm for rotary methods. All options can be used with our combined guide wall/capping beam system.

Contiguous Wall



Piles are installed at centres generally 150mm greater than their diameter therefore leaving gaps in the structural wall where soil is exposed during excavation.

This option is suitable where the retained soil is usually firm to stiff (not generally granular) and where the ground water table is below the level of the maximum excavation. This is the most economic option and normally the fastest method to construct.

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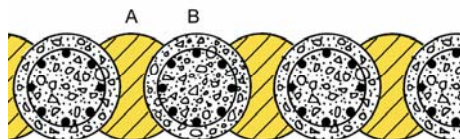
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Secant Wall – hard/soft or hard/firm

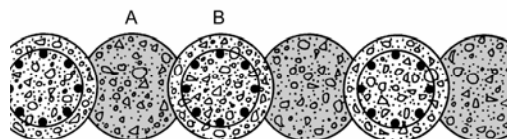


Similar to the contiguous bored pile wall but the gap between piles is filled with an unreinforced cement/bentonite mix (1 to 2N/mm²) for the hard/soft wall and weak concrete (in the order of 10N/mm²) for the hard/firm wall. Construction is carried out by installing the primary piles (A) and then the secondary piles (B) are formed in reinforced concrete, cutting into the primary piles. By using this form of construction the ingress of water to any subsequent excavation can be substantially reduced.

This form of construction is generally used with the continuous flight auger process. Diameters can range from 500mm to 1200mm. Maximum depth of pile would be 29 metres with a recommended exposed height of 7 metres.



Secant Wall – hard/hard



Hard/hard wall construction procedure is very similar to a hard/firm wall but in this case the primary piles (A) are constructed in high strength concrete and may be reinforced. The Secondary piles (B) are cut into the concrete primary piles (A) using heavy duty piling rigs fitted with specially designed cutting heads. As structural concrete is used throughout there is no need to provide a lining wall. The end product provides a fully concreted face and can be an effective alternative to diaphragm wall construction. Diameters generally range



from 600mm to 1200mm with a recommended depth of exposed height of 5 metres for cantilevered walls and 10 metres for a propped wall.

Design

Cementation Skanska's in-house design department has many years' experience in bored pile and diaphragm wall construction enabling them to produce practical and economical designs with viable alternative solutions. □